Space Weather Forecast

Issued on Friday, 10 November 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of isolated Moderate flares. Chance of a Strong geomagnetic storm late tomorrow or early day 3 (12th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low with only Common-class flares observed in the last 24 hours, the largest from the vicinity of an apparently small and magnetically simple region in the southwest. There are currently seven regions on the visible disc.
The largest region on the disc is in the southwest, and is one of two moderately magnetically complex regions, and appears stable. The other region, slightly smaller and in the northwest, has produced the majority of the low level Common class flares. The remaining regions are apparently small, weak, magnetically simple and stable or declining.
A dimming event just west of the centre disc occurred around the time of the largest common class flare and generated a large Coronal Mass Ejection (CME), which has been modelled to be Earth directed and forecast to arrive at Earth tomorrow (11th).

Solar Wind / Geomagnetic Activity: Solar winds showed the continued impact of fast solar winds. with average wind speeds most likely at slightly elevated levels around 450-480 m/s. However, temporary fluctuations were observed in the data, indicating brief periods of strong wind speeds over 600 km/s. These fluctuations are considered to be unreliable. The strength of the magnetic field strength has been weak throughout. The import at north-south component varied weakly. Geomagnetic activity has been Quiet to Unsettled.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) started at background levels, and then increased to moderate levels later in the period, but with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Low solar activity is expected through the period, but with a chance of isolated M-class flares. Returning or new regions are likely to rotate onto the visible disc through the period, starting tomorrow, and so the chance of significant flares may increase over the coming days.

Solar Wind / Geomagnetic Activity: Confidence is high that an Earth-directed will arrive during the forecast period, generating Minor to Moderate geomagnetic storms, with a chance of Strong geomagnetic storms. Confidence is lower regarding the arrival time, but currently the CME is expected to arrive tomorrow (11th) afternoon. Before the arrival of the CME Quiet to Unsettled geomagnetic activity is expected, but with a chance of isolated Active intervals today, due to residual high speed stream influence from CH67. Following the CME arrival geomagnetic activity is expected to gradually decline to Quiet to Unsettled levels by the end of the period.

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Energetic Particles / Solar Radiation: There is a slight chance that the high energy (greater than 10MeV) proton flux reaches Minor Storm levels, due to the locations of the regions on the disc that are most likely to produce significant flares, and also because of the current slight enhancement in the high energy proton flux.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	90	80	30
Strong	G3	No	1	40	20	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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